A.M. intermediate frequency 470 kc/s.
F.M. intermediate frequency 10.7 Mc/s.

ARG Models

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Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 ECF82 {a	97	10·0	—	—	—
{b	122	8·8	120	3·5	—
V2 ECH81 {a	77[1]	3·8[1]	—	—	—
{b	65	5·5	65	4·0	—
V3 EF89	178	7·0	112	2·4	1·5
V4 EABC 80 {a-c	—	—	—	—	—
{d	72·5	0·5	—	—	—
V5 EL84 ...	243	34	191	4	5·6
V6 EZ80	220[3]	—	—	—	250·0[3]

[1]Receiver switched to M.W. [2]A.C. reading, each anode. [3]Cathode current 76mA.

Sketches of tuning drive system as seen from front of chassis with gang at minimum.

CIRCUIT ALIGNMENT

Equipment Required.—An A.M. signal generator covering 160 kc/s–17 Mc/s; an F.M. signal generator covering 10.7 Mc/s and 88-95 Mc/s (If an F.M. generator is not available, an A.M. generator can be used as instructed under "F.M. Alignment with A.M. Generator"); an 0-250 mW output meter; an 0-10 V 20,000 ohms-per-volt meter; an 0.01 µF capacitor.
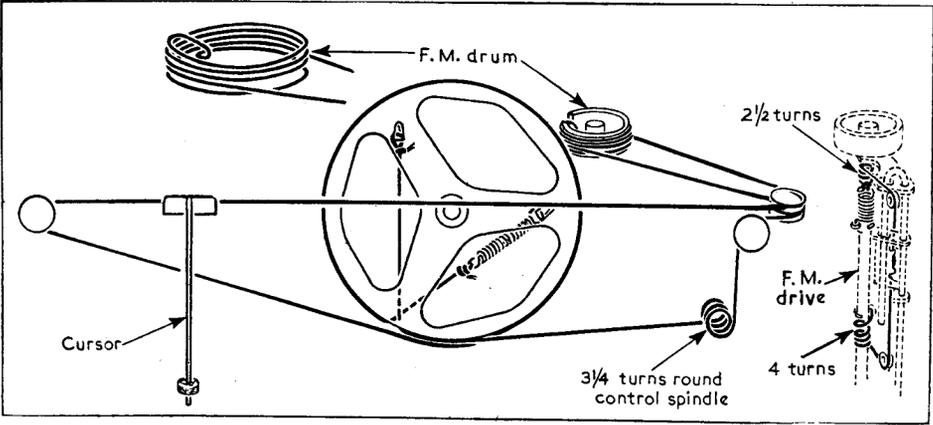
A.M. I.F. Stages

1.—Switch receiver to M.W. and turn gang to minimum capacitance. Connect output of A.M. signal generator across C20 (location reference B1).

2.—Feed in a modulated 470 kc/s signal and adjust the cores of L26 (F4), L25 (B2), L21 (G4) and L20 (A2) for maximum output.

A.M. R.F. and Oscillator Stages

3.—As the tuning scale is fixed to the cabinet, calibration points are marked on the scale backing plate by means of a series of holes. These calibration points are identified in the plan illustration of the chassis (location references A1, B1, C1). Check that with the gang at maximum capacitance the cursor coincides with the datum point on the scale backing plate.

4.—Transfer generator leads to A and E sockets. Switch receiver to L.W. and tune to 857 m. Feed in a 350 kc/s signal and adjust C30 (B1) and C19 (B1) for maximum output.

5.—Tune receiver to 1,875 m, feed in a 160 kc/s signal and adjust C35 (B1) for maximum output. Repeat this adjustment and operation 4 until no further improvement results.

6.—Switch receiver to M.W. and tune it to 200 m. Feed in a 1,500 kc/s signal and adjust C28 (B1) and C18 (B2) for maximum output.

7.—Feed in a 580 kc/s signal and check calibration at 517 m. If a large error exists, tracker C32 or oscillator coil L16 may need replacement.

8.—Switch receiver to S.W. and tune it to 17.7 m. Feed in a 17 Mc/s signal and adjust C27 (B1) and C17 (B2) for maximum output, rocking the gang while adjusting C17 for optimum results.

9.—Feed in a 6 Mc/s signal and check calibration at 50 m. If a large error exists, tracker C31 or oscillator coils L15, L18 may need replacement.

F.M. Alignment with F.M. Generator

10.—Switch receiver to F.M. Connect milliwatt meter to external speaker sockets. Connect voltmeter across C54 (E4) taking the positive meter lead to chassis. Connect F.M. signal generator, via the 0.01 µF capacitor in the live lead, between control grid (pin 2) of V3 and chassis.

11.—Feed in a 30 mV 10.7 Mc/s signal deviated by ±25 kc/s and adjust the cores of L22 (B2) and L23 (F4) for maximum reading on voltmeter.

12.—Adjust signal generator output for a reading of 1.7 V on voltmeter. Re-adjust the cores of L22 and L23 for maximum reading on voltmeter. Disconnect voltmeter from C54.

13.—Transfer live generator lead, with 0.01 µF capacitor, to control grid (pin 2) of V2b. Feed in a 10.7 Mc/s signal, deviated by ±25 kc/s, and adjust the core of L19 (A2) for maximum reading on milliwatt meter, reducing the output from the generator so that the meter reading does not exceed 50 mW.

Capacitors

C1	0·0025µF	A1	C30	40pF	B1		C60	32µF	D4
C2	800pF	G3	C31	3550pF	E3		C61	24µF	D4
C3	0·0025µF	G3	C32	560pF	E3		C62	24µF	D4
C4	—	F3	C33	500pF	E3				
C5	6·8pF	G3	C34	200pF	B1				
C6	6·8pF	G3	C35	80pF	B1		**Resistors**		
C7	15pF	G3	C36	200pF	F4		R1	22kΩ	G3
C8	10pF	A1	C37	10pF	G4		R2	1·5kΩ	G3
C9	8·5pF	G3	C38	200pF	F4		R3	100kΩ	G3
C10	0·0025µF	G3	C39	85pF	A2		R4	2·2kΩ	G3
C11	25pF	A1	C40	100pF	A2		R5	4·7kΩ	G3
C12	125pF	G3	C41	0·04µF	G4		R6	2·2kΩ	G4
C13	10pF	A1	C42	0·01µF	F4		R7	12kΩ	G4
C14	0·001µF	F4	C43	0·04µF	G4		R8	470kΩ	G4
C15	800pF	F4	C44	0·0025µF	F4		R9	47kΩ	F4
C16	200pF	F4	C45	12pF	B2		R10	3·3kΩ	E3
C17	40pF	B2	C46	12pF	B2		R11	330Ω	F3
C18	40pF	B2	C47	100pF	B2		R12	27kΩ	G4
C19	40pF	B1	C48	180pF	B2		R13	470kΩ	F4
C20	528pF	B1	C49	400pF	E4		R14	470kΩ	F4
C21	0·0025µF	G4	C50	500pF	F4		R15	33kΩ	F4
C22	200pF	G4	C51	100pF	F4		R16	150Ω	F4
C23	1200pF	G4	C52	200pF	F4		R17	470kΩ	F4
C24	0·0025µF	G4	C53	0·02µF	F4		R18	2·2kΩ	F4
C25	50pF	F4	C54	4µF	E4		R19	47Ω	F4
C26	528pF	B1	C55	0·005µF	D3		R20	100kΩ	F4
C27	40pF	B1	C56	0·04µF	E4		R21	1MΩ	F4
C28	40pF	B1	C57	0·0025µF	E4		R22	47kΩ	F4
C29[1]	40pF	F3	C58	0·01µF	E4		R23	39kΩ	E4
			C59	50µF	E4		R24	250kΩ	D3
							R25	500kΩ	D3
							R26	20MΩ	E4
							R27	220kΩ	E4
							R28	470kΩ	E4
							R29	120kΩ	E4
							R30	150Ω	D4
							R31	680Ω	D3
							R32	680Ω	D4

Coils[2]

L1	—	G4
L2	—	G4
L3	—	A1
L4	—	A1
L5	—	G3
L6	—	A1
L7	—	A1
L8	—	A1
L9	—	A1
L10	2·3	B2
L11	28·0	B1
L12	—	B2
L13	2·6	B1
L14	30·0	B1
L15	—	F3
L16	2·5	F3
L17	15·0	F3
L18	1·0	F3
L19	—	A2
L20	10·0	A2
L21	10·0	A2
L22	—	B2
L23	—	B2
L24	—	B2
L25	10·0	B2
L26	7·0	B2
L27	2·5	—

Transformers[2]

T1	{ a	430·0 }	D4
	{ b	— }	
T2	{ a	— }	C1
	{ b	215·0 }	
	{ c	215·0 }	
	{ d	28·0 }	

[1]May be 20 pF. [2]Approximate D.C. resistance in ohms.

14.—Transfer live generator lead, with 0.01 µF capacitor, to control grid (pin 2) of **V1b**. Adjust generator output during following alignment so that meter reading does not exceed 50 mW. Feed in a 10.7 Mc/s signal, deviated by ±25 kc/s, and adjust the core of **L9** (G3) for maximum output. Re-adjust the cores of **L19** and **L9** until no further improvement results. Finally, adjust the core of **L8** (A1) for maximum output.

15.—Note output required from signal generator to produce a 50 mW reading on meter.

16.—Replace F.M. generator with A.M. generator. Feed in a 10.7 Mc/s 30% modulated signal of the same size as that used in operation 15.

17.—Tune the signal generator through the response and check that a minimum reading, not greater than 0.2 mW, occurs within the limits ±50 kc/s of 10.7 Mc/s. Disconnect A.M. generator.

18.—Connect F.M. generator to F.M. aerial sockets, connecting the larger socket to chassis if using a co-axial output.

19.—Tune receiver to 88 Mc/s, feed in an 88 Mc/s signal deviated by ±25 kc/s and adjust **C8** (A1) for maximum output.

20.—Feed in a 95 Mc/s signal deviated by ±25 kc/s and tune it in on receiver. Check that the calibration is within the limits of ±0.5 Mc/s. If a larger error exists adjust the core of **L6** (A1) to correct it.

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21.—Repeat operations 19 and 20 until no further improvement results.

22.—Tune receiver to 91 Mc/s, feed in a 91 Mc/s signal, deviated by ±25 kc/s, and adjust the cores of **L4** (A1) and **L5** (A1) for maximum output.

F.M. Alignment with A.M. Generator

23.—Connect voltmeter across **C54**. Fully unscrew the core of **L23** (F4). Carry out the adjustment to **L22** in operation 11, and the

Switch Table

Switches	Gram.	F.M.	L.W.	M.W.	S.W.
S1	—	—	c	—	—
S2	—	—	—	—	c
S3	—	—	c	c	—
S4	—	—	—	c	c
S5	—	—	—	c	c
S6	—	c	—	—	—
S7	—	c	—	—	—
S8	—	—	—	—	c
S9	—	—	—	c	—
S10	—	—	c	c	—
S11	—	—	c	c	c
S12	—	—	—	—	c
S13	—	—	—	c	—
S14	—	—	c	—	—
S15	—	c	—	—	—
S16	—	—	—	—	c
S17	—	—	—	c	c
S18	—	—	—	—	c
S19	—	—	—	c	—
S20	—	—	c	—	—
S21	—	—	c	c	c
S22	—	c	—	—	—
S23	—	—	c	c	c
S24	—	c	—	—	—
S25	—	—	c	c	c
S26	—	c	c	c	c
S27	—	c	—	—	—
S28	—	c	—	—	—
S29	—	—	c	c	c
S30	—	—	—	c	—
S31	c	—	—	—	—

adjustments in operations 13 and 14, employing an A.M. generator with an unmodulated output. Make the adjustments for maximum output on voltmeter connected across **C54**.

24.—Carry out operations 18-22 using A.M. signal generator with an unmodulated output. Make the adjustments for maximum output on voltmeter connected across **C54**. Reduce the generator output during alignment so that meter reading does not exceed 2 V.

25.—Feed in a 91 Mc/s unmodulated signal and tune it in on receiver. Adjust output of generator for a meter reading of 2.2 V.

26.—Connect milliwatt meter across Ext. L.S. sockets. Without altering generator output level, modulate signal to depth of 30% and adjust core of **L23** (F4) for minimum output on milliwatt meter. Two minima will be found as the core of **L23** is screwed inwards. The second one (core further in) is the correct one. For satisfactory A.M. rejection, this reading should not be greater than 0.2 mW.
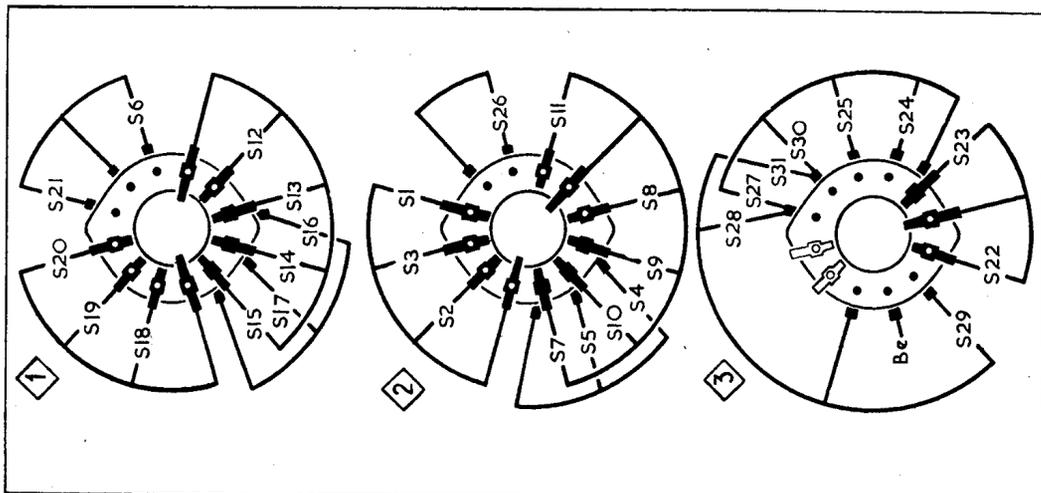
Diagrams of the band switches as viewed in underside chassis illustration above.